Journal of Symbolic Computation 46 (2011) 93–94

Contents lists available at ScienceDirect

Journal of Symbolic Computation

journal homepage: www.elsevier.com/locate/jsc

Foreword

This special issue collects selected papers that address specification and verification aspects of Web systems using symbolic computation techniques. It has been organized after the workshop WWV 2009: Automated Specification and Verification of Web Systems, which took place in Hagenberg, Austria, on July 17, 2009.

The increased complexity of Web sites and the explosive growth of Web-based applications has turned their design and construction into a challenging problem. Nowadays, many companies have diverted their Web sites into interactive, completely-automated, Web-based applications (such as Amazon, on-line banking, or travel agencies) with a high complexity that requires appropriate specification and verification techniques and tools. Systematic, formal approaches to analysis and verification can deal with the problems of this particular domain by automated and reliable tools that also incorporate semantic aspects. The accepted papers address some of these challenging problems, such as formal verification of Web-based applications and UML models of services, consistency checking and verification of Web applications and Web-based documentations, and modeling as well as validation of accessibility issues related to the development of Rich Internet Applications.

The article by *Gregory Malecha, Greg Morrisett, and Ryan Wisnesky* discusses, through a complete case-study, specification and verification of a Web-based application using the Coq proof assistant. The application is a course gradebook developed with the Ynot library for verified imperative programming inside Coq. The approach combines dependently typed programming and separation logic to obtain a powerful and flexible system to verify Web-based applications.

Federico Banti, Rosario Pugliese, and Francesco Tiezzi consider the problem of automated verification of service properties. They present the tool, called Venus, for automated verification of service models specified by the UML4SOA profile. The tool takes as input service models specified by UML activity diagrams, translates the UML4SOA models into terms of the process calculus COWS, service property statements into formulas of the temporal logic SocL, and then performs model checking of the formulas over the COWS terms.

The article by *Zef Hemel, Danny M. Groenewegen, Lennart C.L. Kats, and Eelco Visser* identifies inconsistencies of Web applications as a problem that should be addressed at early stages of application development. Accurate static consistency checking simplifies maintenance of source code. The authors propose a declarative, rule-based approach to static consistency checking and demonstrate it with an implementation in the Stratego transformation language for WebDSL, a domain-specific language for Web applications.

Consistency verification is also the subject of the article by *Christian Schönberg, Franz Weitl, and Burkhard Freitag*. They address this problem for Web-based technical documentations, presenting a framework which covers the entire cycle of document verification: from information extraction to verification by model checking and counterexample generation. Information extraction process produces an RDF representation of the document. Specifications are translated into temporal

0747-7171/$ – see front matter
doi:10.1016/j.jsc.2010.08.003

description logic formulas, a verification model is generated, and specifications are verified by model checking. In case of specification violations, counterexamples are returned.

Marino Linaje, Adolfo Lozano-Tello, Miguel A. Perez-Toledano, Juan Carlos Preciado, Roberto Rodriguez-Echeverria, and Fernando Sanchez-Figueroa propose a semantic approach to deal with the problem of introducing accessibility properties into user interfaces for Rich Internet Applications by extending the RUX-Method. The validation process of accessibility issues exploits linear temporal logic specifications.

We would like to thank the authors for their contributions to this special issue and to the referees for their careful and thorough work. We are grateful to Hoon Hong, the Editor-in-Chief of the Journal of Symbolic Computation, for his support and assistance during the editorial process.

Demis Ballis
Department of Mathematics and Computer Science, University of Udine, Via delle Scienze, 206, 33100 Udine, Italy
E-mail address: demis.ballis@dimi.uniud.it.

Temur Kutsia [1]
Research Institute for Symbolic Computation, Johannes Kepler University, Altenbergerstrasse 69, A-4040 Linz, Austria
E-mail address: kutsia@risc.uni-linz.ac.at.

12 August 2010
Available online 27 August 2010

[1] Tel.: +43 732 2468 9982; fax: +43 732 2468 9930.